May 18, 1943 D. LEWY 2,319,550

FOOT ARCH SUPPORT

Filed March 10, 1941

Fig. 1

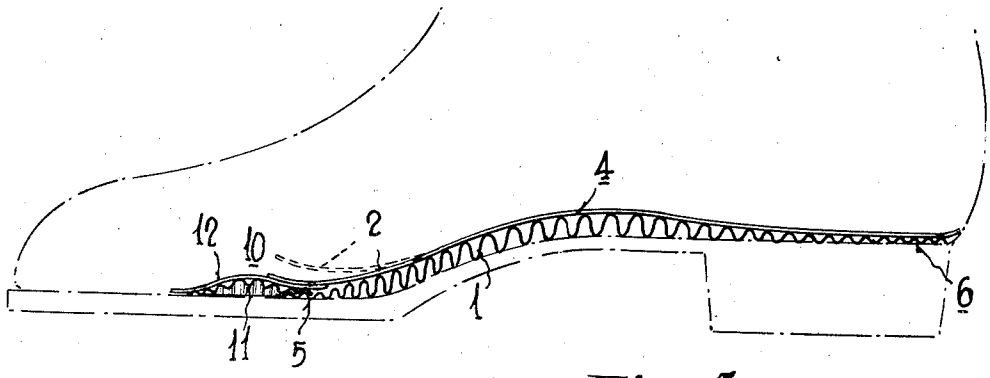


Fig. 5

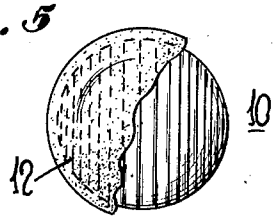


Fig. 2

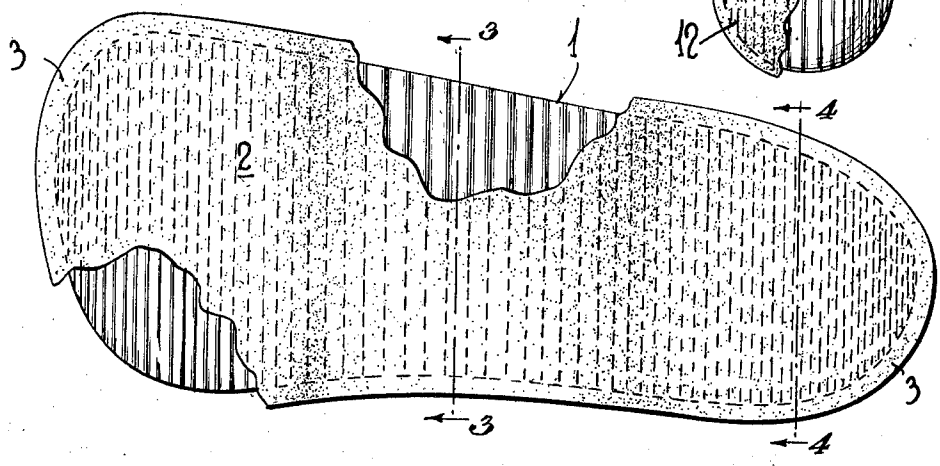


Fig. 3

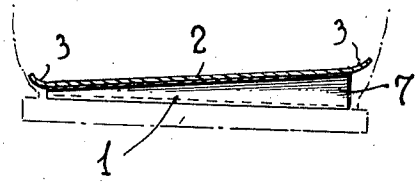
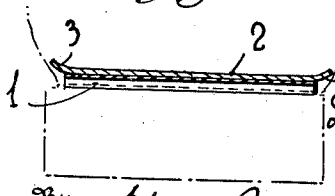


Fig. 4



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FOOT ARCH SUPPORT

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Application March 10, 1941, Serial No. 382,642

10 Claims. (Cl. 36—71)

This invention relates generally to arch supports for the human foot and in particular to the type of arch supports adapted to be used inside of shoes.

The invention relates to two types of supports; one support being used for the plantar arch and the other support being used for the metatarsal arch.

The normal foot has a longitudinal arch extending from the extremity of the heel to the balls of the toes, this arch being known as the plantar arch. The foot also has a transverse arch running from the cuboid bone to the inner cuneiform bone on the inside of the foot. The foot also has a metatarsal arch comprising five more or less elongated bones. It frequently happens that these arches descend below their proper levels, causing a flattening of the sole of the foot, and this flattening may continue if some artificial support is not resorted to.

The primary object of this invention is to provide arch supports which may be used in shoes and which will provide a resilient support for the arches referred to above.

Another object of the invention is to provide arch supports, the upper surfaces of which are curved to shape the natural curvature of the arches of the foot.

Another object is to provide a corrugated arch support which may be built into the shoe as an integral part of the sole or placed inside the shoe.

Still another object is to provide an arch support having infinite flexibility in length, that is, in line with the longitudinal arch, and yet have enough rigidity to support the arch and capable of being built up to meet that part of the foot which does not ordinarily come in contact with the ground. At the same time, the transverse arch is also supported.

Another object is to provide an independent metatarsal arch support but so arranged that it can be locked or combined with the principal arch support to form, in effect, one combined support.

These and other objects will be apparent from the accompanying drawing and the following description.

Referring to the drawing:

Figure 1 is a view showing the arch supports as applied in a shoe;

Figure 2 is an enlarged plan view of the principal or longitudinal and transverse arch support;

Figure 3 is a cross section on line 3—3 of Figure 2;

Figure 4 is a cross section on line 4—4 of Figure 2; and

Figure 5 is a plan view of the metatarsal arch support shown in Figure 1.

More particularly describing the invention, the principal arch support comprises a main body 1 formed of some material which is thin, light in weight, capable of being shaped to fit the sole of the foot and yet resilient, flexible and rigid enough to adequately support the arch. Stainless steel seems to be an answer to this requirement, yet other materials might be used.

This arch support should be made of a minimum size to fit within a shoe so that, when covered with a leather insole 2 the leather can extend beyond the marginal edge portion as at 3 and be trimmed away to fit the foot and the shoe. It is to be noted that the arch support is upwardly arched at its center 4 and at the front tnd rear ends, 5 and 6 respectively, it is of substantially equal thickness and very slightly concaved to receive the ball and heel of the foot. The main body 1, made of stainless steel, for instance, is corrugated, as shown, the corrugations extending laterally of the arch support and being of graduated dimensions, as shown, the deepest dimensions falling in the region of the arched center 4. The corrugations are of shallow dimensions in the portions 5 and 6. As shown in Figures 1 and 3, the corrugations are higher on the inside (large toe side), as at 7, than on the outside in order to throw the weight of the foot mostly toward the outside. The laterally extending corrugations provided as specified above cover, and extend throughout, the entire area of the arch support. The forward end of the arch support terminates in the region of the metatarsal arch. Heretofore, most arch supports have been made higher in some special manner, and therefore, in the present structure, it is necessary to make the corrugations higher, as at 7. Therefore, the corrugations are deepest in the arched center area corresponding to the area of the foot which does not touch the walking surface in a normal foot and where additional support is needed to cause the surface of the support to conform to the sole of the foot.

It is to be noted that the arch support will be extremely rigid, yet flexible and resilient enough to not hamper the foot in normal use.

In Figure 5, there is shown a metatarsal-arch support or button 10, circular in shape and having an arched central portion 11 and being of substantially equal thickness in the marginal edge portion. The button 10 is made of stain-

less steel, for instance, corrugated in the same manner as is the arch heretofore described, the corrugations extending laterally and being of graduated dimensions and deepest in the arched center to cause the surface of the sheet to conform to the sole of the foot. The shallow corrugations are in the marginal edge portion of the button. The button is covered with a leather layer 12.

When using the metatarsal support in combination with the principal arch support, it is to be noted from Figure 1 that the button is secured to the principal arch by causing the corrugations on the button to interengage with the corrugations on the principal arch, within the zone of securement. This is possible because the leather insole cover 2 is not secured to the main body 1 except possibly near the heel or at two points on either side near the middle of the principal arch support. The metatarsal button can be moved back and forth, a corrugation at a time, until the most effective location has been determined. The insole 2 will overlap the metatarsal button. Ordinarily, the placement of the metatarsal button is a rather difficult matter to handle because it is quite essential that this support be in exactly the right location for the individual foot. If it is set an eighth of an inch too far forward, it might not be effective and is likely to be painful. If it is set an eighth of an inch too far back, it might not be effective. The present construction lends itself to an effective placement of the metatarsal arch support with reference to the principal arch support.

Materials other than stainless steel might conceivably be employed to accomplish the same results herein set forth. However, stainless steel is strong; will not rust, is light in weight, flexible enough and rigid enough to make a good arch support. The arch supports shown herein have the added advantage of being ventilated at all times by reason of the corrugations.

It is to be understood that changes in the details of construction and in the combination and arrangement of parts may be resorted to which fall within the scope of the invention as claimed.

I claim:

1. A foot-arch supporter adapted to fit the sole of the foot, being upwardly arched substantially at its center to support the arch of the foot and being of substantially equal thickness and slightly concaved at front and rear to receive the ball and heel of the foot respectively, said supporter comprising a single corrugated sheet of metal corrugated throughout the area thereof, said corrugations being of graduated dimensions to cause the surface of the sheet to conform to the sole of the foot and providing a supporter having extreme longitudinal flexibility as well as vertical flexibility.

2. A foot-arch supporter adapted to fit the sole of the foot, being upwardly arched substantially at its center to support the arch of the foot and being of substantially equal thickness and slightly concaved at front and rear to receive the ball and heel of the foot respectively, said supporter comprising a single corrugated sheet of metal corrugated throughout the area thereof, said corrugations being of graduated dimensions and deepest in the arched center to cause the surface of the sheet to conform to the sole of the foot and providing a supporter having extreme longitudinal flexibility as well as vertical flexibility.

3. A foot-arch suporter adapted to fit the sole of the foot, being upwardly arched substantially at its center to support the arch of the foot and being of substantially equal thickness and slightly concaved at front and rear to receive the ball and heel of the foot respectively, said supporter comprising a single corrugated sheet of metal corrugated throughout the area thereof, said corrugations extending lateally of the supporter and being of graduated dimensions and deepest in the arched center to cause the surface of the sheet to conform to the sole of the foot and providing a supporter having extreme longitudinal flexibility as well as vertical flexibility.

4. A foot-arch supporter adapted to fit the sole of the foot, being upwardly arched substantially at its center to support the arch of the foot and being of substantially equal thickness and slightly concaved at front and rear to receive the ball and heel of the foot respectively, said supporter comprising a single corrugated sheet of metal corrugated throughout the area thereof, said corrugations extending laterally of the supporter and being of graduated dimensions and deepest in the arched center to cause the surface of the sheet to conform to the sole of the foot and providing a supporter having extreme longitudinal flexibility as well as vertical flexibility, and an insole overlying and secured to the corrugated sheet.

5. A foot-arch supporter adapted to fit the sole of the foot, being upwardly arched substantially at its center to support the arch of the foot and being of substantially equal thickness and slightly concaved at front and rear to receive the ball and heel of the foot respectively, said supporter comprising a single corrugated sheet of metal, said corrugations extending laterally of the supporter and being of graduated dimensions and deepest in the arched center where additional support is needed to cause the surface of the sheet to conform to the sole of the foot and providing a supporter having extreme longitudinal flexibility as well as vertical flexibility.

6. A foot-arch supporter adapted to fit the sole of the foot, being upwardly arched substantially at its center to support the arch of the foot and being of substantially equal thickness and slightly concaved at front and rear to receive the ball and heel of the foot respectively, said supporter comprising a single corrugated sheet of metal corrugated throughout the area thereof, said corrugations extending laterally of the supporter and being of graduated dimensions and deepest in the arched center area corresponding to the area of the foot which does not touch the walking surface in a normal foot and where additional support is needed to cause the surface of the sheet to conform to the sole of the foot and providing a supporter having extreme longitudinal flexibility as well as vertical flexibility.

7. A foot-arch supporter adapted to fit the sole of the foot, being upwardly arched substantially at its center to support the arch of the foot and being of substantially equal thickness and slightly concaved at front and rear to receive the ball and heel of the foot respectively, said supporter comprising a resilient single corrugated sheet of metal corrugated throughout the area thereof, said corrugations being of graduated dimensions to cause the surface of the sheet to conform to the sole of the foot.

8. A metatarsal-arch supporter adapted to fit the sole of the foot, being circular in form and upwardly arched substantially at its center to support the metatarsal-arch and being of substantially equal thickness in the marginal edge

portion, said supporter comprising a resilient corrugated sheet of metal, said corrugations extending laterally of the supporter and being of graduated dimensions and deepest in the arched center to cause the surface of the sheet to conform to the sole of the foot and a covering overlying and secured to the corrugated sheet.

9. In combination, a foot-arch supporter and a metatarsal-arch supporter, said supporters adapted to fit the sole of the foot, said foot-arch supporter being upwardly arched substantially at its center to support the arch of the foot and being of substantially equal thickness and slightly concaved at front and rear to receive the ball and heel of the foot respectively, said supporter comprising a corrugated sheet of metal, said corrugations being of graduated dimensions to cause the surface of the sheet to conform to the sole of the foot, said metatarsal-arch supporter being circular in form and upwardly arched substantially at its center to support the metatarsal-arch and being of substantially equal thickness in the marginal edge portion, said supporter comprising a corrugated sheet of metal, said corrugations being of graduated dimensions to cause the surface of the sheet to conform to the sole of the foot, said metatarsal-arch supporter being removably secured to the front portion of said foot-arch supporter by having a limited number of the corrugations in the zone of securement interengage.

10. In combination, a foot-arch supporter and a metatarsal-arch supporter, said supporters adapted to fit the sole of the foot, said foot-arch supporter being upwardly arched substantially at its center to support the arch of the foot and being of substantially equal thickness and slightly concaved at front and rear to receive the ball and heel of the foot respectively, said supporter comprising a corrugated sheet of metal, said corrugations extending laterally of the supporter and being of graduated dimensions and deepest in the arched center to cause the surface of the sheet to conform to the sole of the foot and an insole overlying and partially secured to the corrugated sheet, said metatarsal-arch supporter being circular in form and upwardly arched substantially at its center to support the metatarsal-arch and being of substantially equal thickness in the marginal edge portion, said supporter comprising a corrugated sheet of metal, said corrugations extending laterally of the supporter and being of graduated dimensions and deepest in the arched center to cause the surface of the sheet to conform to the sole of the foot and a covering overlying and secured to the corrugated sheet, said metatarsal-arch supporter being removably secured to the front portion of said foot-arch supporter by having a limited number of the corrugations in the zone of securement interengage.

DANIEL LEWY.

CERTIFICATE OF CORRECTION.

Patent No. 2,319,550. May 18, 1943.

DANIEL LEWY.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 1, second column, line 20, for "tnd" read --and--; page 2, second column, line 7, claim 3, for "lateally" read --laterally--; line 35, claim 5, after "metal" and before the comma insert --corrugated throughout the area thereof--; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 30th day of May, A. D. 1944.

Leslie Frazer

(Seal)

Acting Commissioner of Patents.